What is claimed:

1. An isolated variant of a G_{a15} protein that exhibits increased coupling to a given GPCR relative to the native G_{a15} protein and/or which couples to a particular GPCR not normally coupled by the native G_{a15} protein.

2. The variant G_{a15} protein of claim 1, wherein the last 5 amino acids are identical to the last 5 amino acids of a different G protein.

3. The variant Ga15 protein of claim 2, wherein said different G protein is selected from the group consisting of G_{ail}, G_{aq} G_{as}, G_{ai3}, G_{ao}, G_{a12}, G_{az}, G_{a13}, and G_{al4}.

4. The variant G protein of claim 3, wherein said variant includes at least one point mutation that further increases coupling.

5. The variant G protein of claim 4, wherein said mutation is a Glycine to Aspartic acid change at position 66.

6. The variant G protein of claim 1, wherein said variant G_{a15} protein is derived by substituting at least 6 residues with the corresponding 6 residues of another G protein.

7. The variant G protein of claim 6, wherein said other G protein is a mouse G protein.

8. The variant G protein of claim 6, wherein said other G protein is a human G protein.

9. The variant G,15 protein of claim 1, wherein at least five amino acids in the C terminus of said G,15 protein are replaced by at least about five amino acids of another G protein and where said amino acids increase coupling of said variant G_{a15} protein as compared to the corresponding native Ga15 protein.

10. The variant Ga15 protein of claim 9, wherein said variant G_{a15} protein further contains at least one point mutation that acts in addition to said C-terminal substitution to increase coupling of said variant G protein to a particular GPCR or GPCR combination relative to the corresponding native G_{a15} protein.

11. An isolated G_{a15} variant with greater than 95% amino acid sequence identity to a sequence encoded with the SEQ ID NO: 2 with the proviso that the 5 carboxy-terminal codons are identical to the 5 carboxy-terminal codons of another G protein selected from the group G_{ail}, Gaq, Gas, G_{ai3},G_{az}, G_{ao}, G_{a12}, G_{a13}, and G_{a14}.

12. An isolated nucleic acid sequence encoding the G_{a15} protein variant of claim 1.

13. An isolated nucleic acid sequence encoding the G_{a15} protein variant of claim 11.

14. An isolated nucleic acid sequence encoding a G05protein variant including a nucleic acid encoding a polypeptide with greater than 80% amino acid sequence identity to SEQ ID NO: 2 with the proviso that the last six codons are selected from the group consisting of those contained in SEQ ID NO: 4, 5, 6, 7, 8, 9, 10, 11 and 12.

15. An isolated nucleic acid sequence encoding a G protein variant including a nucleic acid encoding a polypeptide with greater than 90% amino acid sequence identity to SEQ I D NO: 2 with the proviso that the last six codons of said sequence are selected from those contained in SEQ ID NO: 4, 5, 6, 7, 8, 9, 10, 11 and 12.

16. An isolated nucleic acid sequence encoding a G protein variant including a nucleic acid encoding a polypeptide with greater than 95% amino acid sequence identity to SEQ ID NO: 2 with the proviso that the last six codons of said sequence are selected from those contained in SEQ ID NO: 4, 5, 6, 7, 8, 9, 10, 11 and 12.

17. An antibody that selectively binds to the variant G,15 protein of claim 1, but not to the native Ga15 alpha protein.

18. An expression vector including the nucleic acid sequence of claim 15 or 16 operably linked to a promoter that functions in mammalian cells or *Xenopus* oocytes.

19. An expression vector encoding a variant Gal 5 protein according to claim 1.

20. A method for identifying a compound that modulates GPCR signaling including the steps of:

(i) contacting the compound with a cell expressing the Gal 5 variant protein according to claim 1 and a GPCR; and

(ii) determining the functional effect of said compound upon the GPCR.

21. The method of claim 20, wherein said cell expressing said G(Xj5 variant protein is a mammalian cell.

22. The method of claim 20, wherein said cell expressing said GOC15 variant protein is a *Xenopus* oocyte.

23. The method of claim 20, wherein the functional effect is determined by measuring changes in intracellularcAMP, IP_3, orCa^{2+}.

24. The method of claim 20, wherein the functional effect is determined by measuring binding of a radiolabeled GTP to said variant G protein.

25. The method of claim 20, wherein the functional effect is determined by measuring changes in the electrical activity of the cells expressing said GOC15 variant protein.

26. The method of claim 20, wherein the functional effect is determined by measuring the modification of an intracellular effector enzyme.

27. The method of claim 20, wherein said Gal 5 variant protein includes sequences of a native G protein from a human or rodent.

28. A method for producing a functional umami taste receptor including producing a cell expressing a variant Gal 5 protein according to claim 1 or 2 and T1 R1/T1 R3.

29. The method of claim 28, wherein said T1 R1 and/or T1 R3 is human.

30. The method of claim 28, wherein said T1 R1 and/or T1 R3 is rat.

31. The method of claim 28, wherein said T1 R1 and/or T1 R3 is mouse.

32. A method for producing a functional sweet taste receptor including producing a cell expressing a variant Ga15 protein according to claim 1 or 2 and T1 R2/T1 R3.

33. The method of claim 32, wherein said T1 R2 and/or T1 R3 is human.

34. The method of claim 32, wherein said T1 R2 and/or T1 R3 is rat.

35. The method of claim 32, wherein said T1 R2 and/or T1 R3 is mouse.